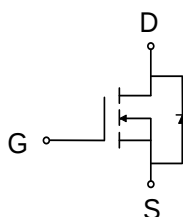
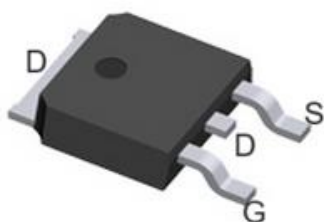


N-Channel Multilayer Epitaxial Super Junction Power MOSFET

MCR65B280D

TO-252



Features

- Reduced Switching & Conduction Losses
- Lower Gate Resistance
- 100% Avalanche Tested
- Pb free, Halogen Free, and RoHS Compliant

Applications

- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		650	V
VGS	Gate-Source voltage		±30	V
ID	Continuous drain current	T _C =25°C	12.5	A
		T _C =100°C	8.0	A
IDM	Pulse drain current tested	T _C =25°C	37.5	A
EAS	Avalanche energy, single pulsed		54	mJ
PD	Total power dissipation	T _C =25°C	111	W
T _{STG} , T _J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.4	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Static Electrical Characteristics @T_j=25°C (unless otherwise stated)

V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1mA	650	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V	--	--	1	μA
		V _{DS} =480V, V _{GS} =0V, T _J =125°C	--	2	--	
IGSS	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =0.8mA	2.5	--	4.5	V
RDS(on)	Drain-Source On-State Resistance	V _{GS} =10V, I _D =4A	--	238	280	mΩ

Dynamic Electrical Characteristics@T_j = 25°C (unless otherwise stated)

C _{iss}	Input Capacitance	V _{DS} =400V, V _{GS} =0 V , f=250kHz	--	782	--	pF
C _{oss}	Output Capacitance		--	22	--	pF
C _{o(tr)}	Time Related Output Capacitance	V _{DS} =0V to 400V, V _{GS} =0 V	--	298	--	pF
C _{o(er)}	Energy Related Output Capacitance		--	38	--	pF
Q _g	Total Gate Charge at 10 V	V _{DS} =400V, I _D =5.3A , V _{GS} =10V	--	19.5	--	nC
Q _{gs}	Gate-Source Charge		--	3.6	--	nC
Q _{gd}	Gate-Drain Charge		--	9.8	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =400V V _{GS} =10V R _G =10Ω I _D =5.3A	--	7.8	--	ns
Tr	Turn-on Rise Time		--	6.6	--	ns
Td(off)	Turn-Off Delay Time		--	38.2	--	ns
Tf	Turn-Off Fall Time		--	8.3	--	ns

Source-Drain Diode Characteristics

I _S	Continuous Source Current (Body Diode)	T _C = 25 °C	--	--	12.5	A
I _{SM}	Maximum Pulsed Current (Body Diode)		--	--	37.5	A
V _{SD}	Diode Forward Voltage	I _{SD} =4.0A V _{GS} =0V	--	--	1.2	V
trr	Reverse Recovery Time	di/dt=100A/us	--	233	--	ns
Qrr	Reverse Recovery Charge	I _{SD} =4A, V _{DD} =400V	--	2.1	--	nC

Typical Characteristics

Figure 1. On-Region Characteristics

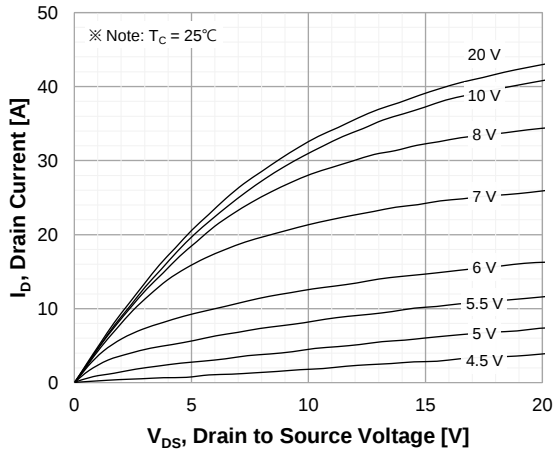


Figure 2. Transfer Characteristics

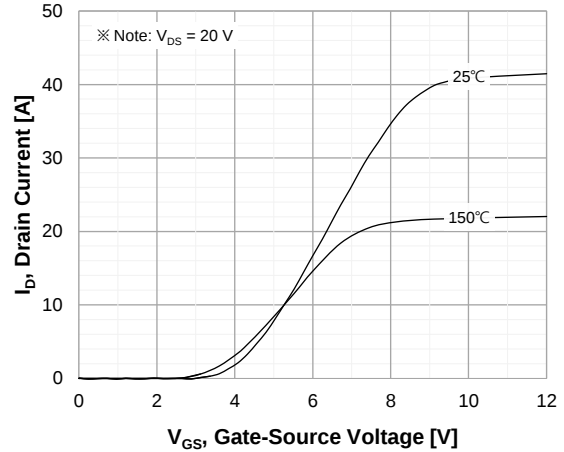


Figure 3. On-Resistance Characteristics vs. Drain Current and Gate Voltage

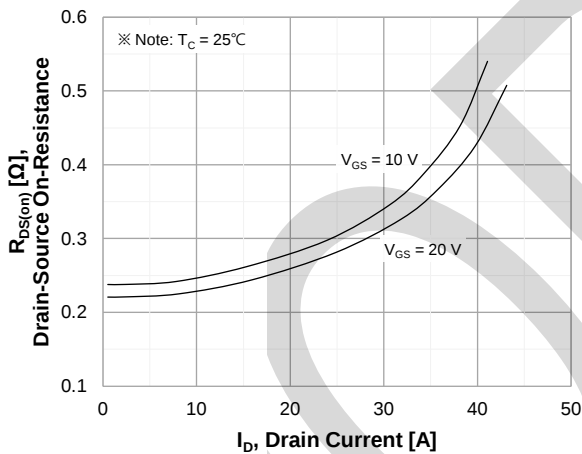


Figure 4. Diode Forward Voltage Characteristics vs. Source-Drain Current and Temperature

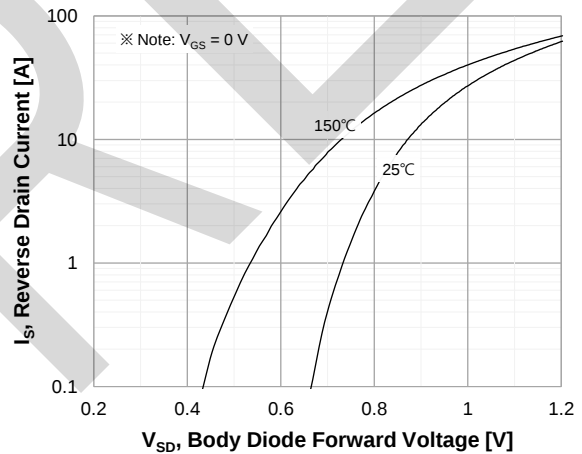


Figure 5. Capacitance Characteristics

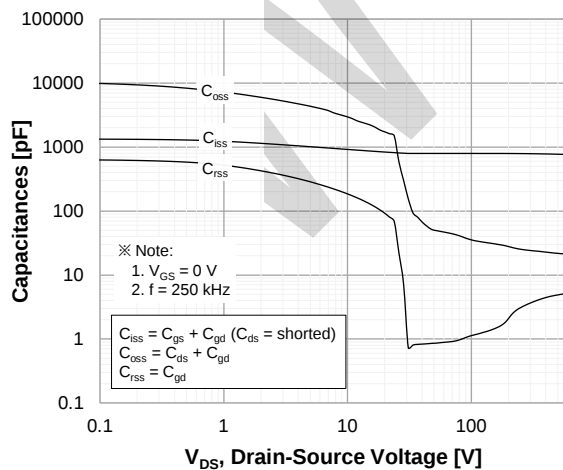
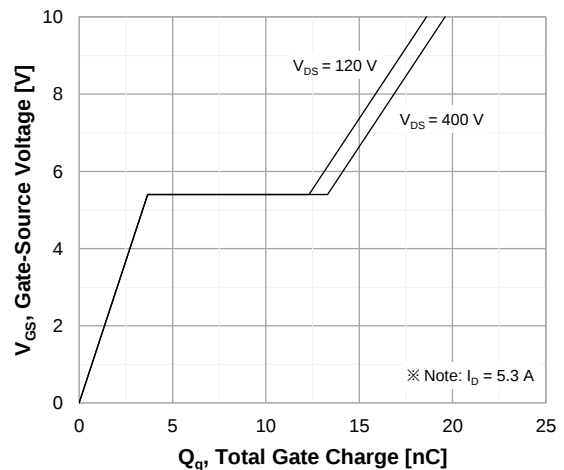


Figure 6. Gate Charge Characteristics



Typical Characteristics

Figure 7. Breakdown Voltage Characteristics vs. Temperature

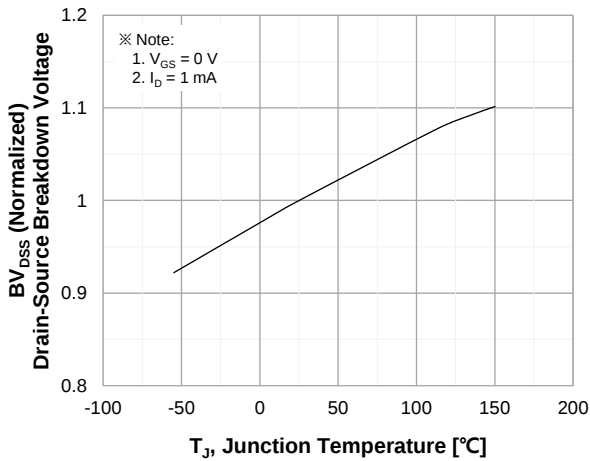


Figure 8. On-Resistance Characteristics vs. Temperature

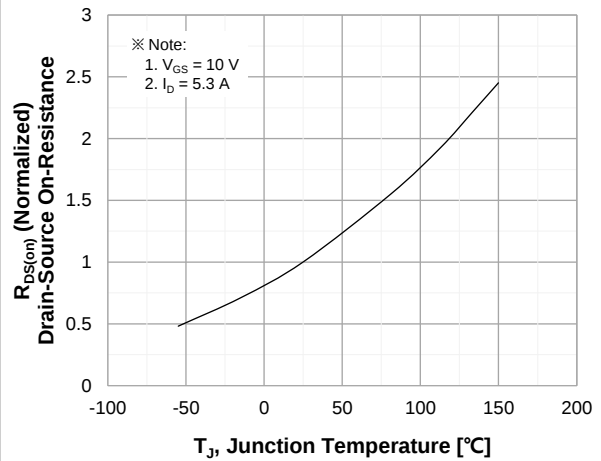


Figure 9. Maximum Safe Operating Area

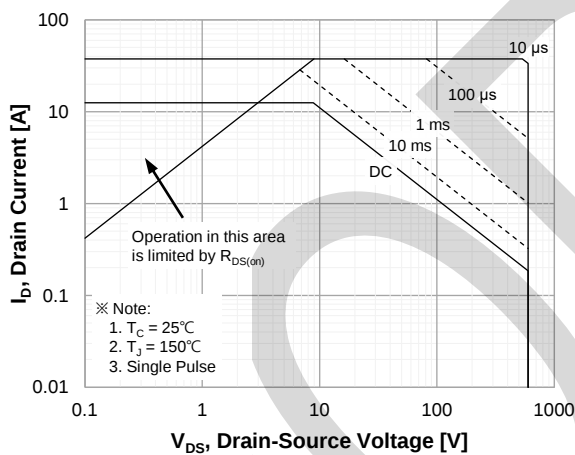


Figure 10. Maximum Drain Current vs. Case Temperature

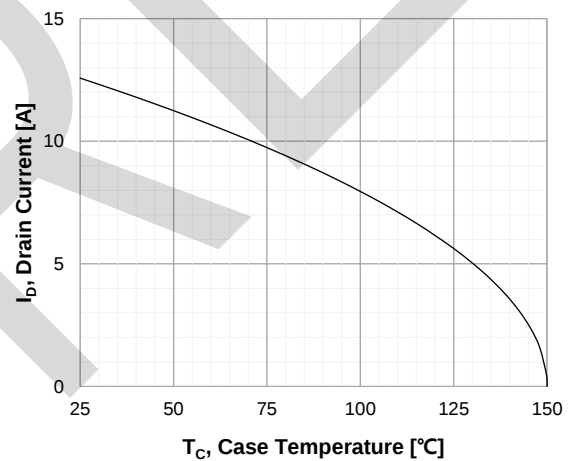


Figure 11. E_{OSS} vs. Drain to Source Voltage

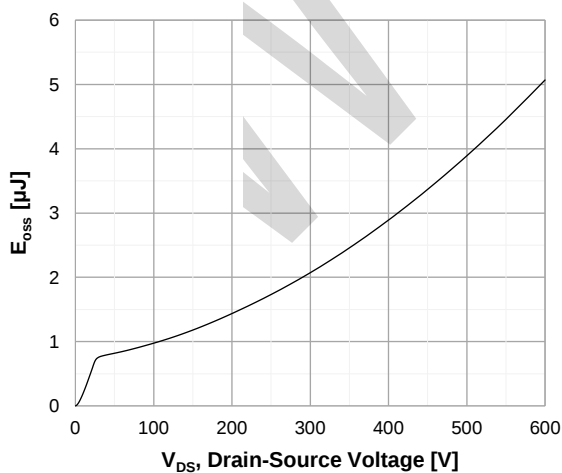
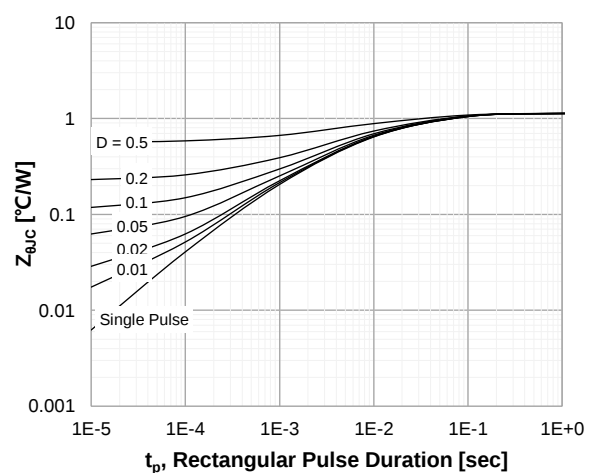
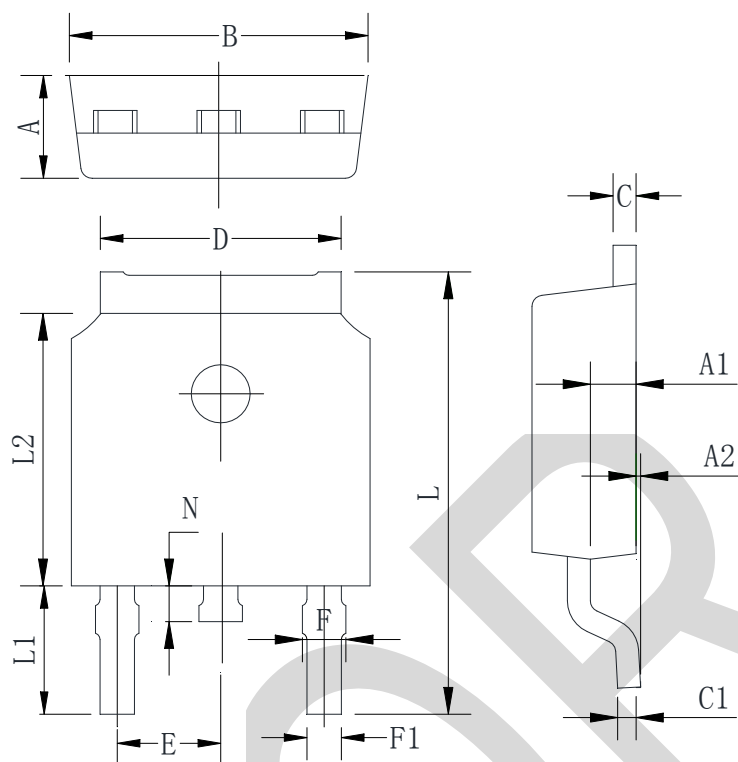


Figure 12. Transient Thermal Response Curve

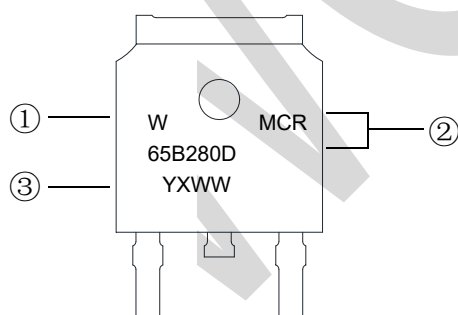


PACKAGE OUTLINE DIMENSIONS



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.910	1.010	1.110
A2	0.050	0.150	0.250
B	6.500	6.600	6.700
C	0.460	0.500	0.580
C1	0.460	0.500	0.580
D	5.120	5.320	5.520
E	2.286 TYP		
F	0.780	0.860	1.020
F1	0.660	0.760	0.860
L	9.600	10.00	10.20
L1	2.600	2.800	3.000
L2	6.000	6.100	6.200
N	0.600	6.800	1.000

Marking Information



① W : Company's trademark

② Product model : MCR65B280D

③ PDC information :

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)

Revision History

No	Revise Contents	Revise Date	Revision No
1	New formulation	10-Jun-2024	1.0
2			
3			
4			
5			
6			
7			